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EXAMINER	
CHANG, EDITH M	

ART UNIT	PAPER NUMBER
2634	9

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/590,594	Applicant(s) KOSMACH ET AL.	
	Examiner Edith M Chang	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on May 14 2004 have been fully considered but they are not persuasive.

Argument: Page 7, regarding claims 1, 13 and 25: Applicants assert neither Yamao et al. nor Iwamura disclose generating a first set of bit metrics based on the energy values in response to the receiver being assigned to the first phase and a second set of bit metrics based on the energy values in response to the receiver being assigned to the second phase as recited in independent claim 1, and similarly recited in independent claims 13 and 25.

Response: Yamao et al.'s receiver (FIG. 19) receives signal transmitted from the transmitter (FIG.16-18). The signal transmitted to the receiver is divided by the DIVISION UNIT 21 FIG.16 (column 5 lines 57-65) wherein the data (a) shown in FIG.17 contains a first phase (e.g. a1 & a2) and a second phase (e.g. a7 & a8) explained in column 10 lines 5-20. In light of the specification (page 2 lines 1-5 of the specification) the phase is defined as part (such as most significant bits or lest significant bits) of signal. In FIG.17 the first phase (a1 & a2) feds to M-ary ENCODER 22-1, in FIG.18 it shows the output sequence (c), and the output is modulated via a 4-valued frequency modulator (24 FIG.16). So the Yamao et al.'s receiver is adapted to generate a first set of bits based on the energy values in response to the receiver being assigned to received signal sent by the corresponding Yamao et al.'s transmitter The rationale of the rejections of claims 1, 13, and 25 in the previous office action stated the receiver of Yamamo et al. comprising the

detector and decoder cited in the claims, it does mean the Yamamo et al.'s receiver receives the signal sending from corresponding transmitter stated and explained in the reference, so the Yamao et al.'s detector generating a first set of bit metrics based on the energy values in response to the receiver being assigned to the first phase and a second set of bit metrics based on the energy values in response to the receiver being assigned to the second phase as recited in independent claim 1, and similarly recited in independent claims 13 and 25.

Argument: Page 8: Iwamura fails to make up for the deficiencies of Yamao et al. and Iwamura has absolutely no disclosure of any relationship between a GMD decoding apparatus and phase whatsoever.

Response: Yamao et al. discloses all subject matter cited in the claims, except explicitly specify the bit metrics in the decoder. Iwamura teaches the bit metrics in GMD decoding. The relationship is the bit metrics.

Argument: Page 8: Furthermore, the Office Action has not provide proper motivation for combining the reference.

Response: Iwamura's invention is a decoding method using error correcting codes or a soft decoding method to minimize the errors of the correlated signal (column 1 lines 5-15, lines 33-40 '620). As Yamao et al.'s receiver providing a decoder capable of realizing high quality signal transmission (column 3 lines 15-20 '498), having/implementing the decoding method minimizing the errors in Yamao et al.'s decoder improve the quality of the received signal. The motivation and benefit are obvious.

The rejections are upheld as the following:

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 13-16 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamao et al. (US 6351498 B1) in view of Iwamura (US 5742620).

Regarding **claims 1, 13 & 25**, except explicitly specify the bit metrics, Yamao et al. discloses all subject matter: a receiver and its method (FIG.19). It comprises: a detector/means (34 FIG.19) adapted to demodulate a received signal to generate a received word, the received word including a plurality of symbols (FIG.18), each symbol containing data associated with a first phase and data associated with a second phase (d-1, d-2 FIG.19), the detector/means being further adapted to generate a plurality of energy values relating each received symbol to one of a plurality of potential symbols (14 FIG.13, column 10 lines 34-38); and a decoder/means (36 FIG.19, FIG.21) adapted to generate a first set detector output based on the energy values in response to the receiver being assigned to the first phase and a second set of detector output based on the energy values in response to the receiver being assigned to the second phase (FIG. 13, column 8 lines 28-60). However Iwamura teaches the decoder/means with bit metrics to identify the least reliable bits (82 FIG.8 the decoder, FIG. 12 composing the metrics, column 1 lines 39-62, column 10 lines 30-40 the GMD decoding provides the bit metrics). At the

time of the invention, it would have been obvious to a person of ordinary skill in the art to have the decoding taught by Iwamura (Abstract, FIG.3) in Yamao et al.'s FSK energy detector wherein the metrics based on energy values and reducing errors (column 7 lines 15-30, column 8 line 65-column 9 line10 '498) suggested by Yamao et al. (column 8 lines 50-55 where the correlation is performed, and in FIG.21 and column 10 lines 45-55 wherein the patterns of word codes provided for correlating '498), to have a more efficient decoding with less amount of calculation and parallel processing ability (column 5 lines 10-25 '620). Therefore, it would have been obvious to combine Iwamura's teaching with Yamao et al.'s FSK energy detector to obtain the invention as specified in claim 1.

Regarding **claims 2 & 14**, except explicitly specify the least reliable bit, Yamao et al. discloses generating a plurality of candidate codewords (FIG.13, FIG.14, where the h1 and h2 are codewords). However Iwamura teaches generating a plurality of candidate codewords based on the least reliable bits (FIG.3, S211-S214 FIG.12). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the decoding taught by Iwamura (Abstract, FIG.3) in Yamao et al.'s FSK energy detector to have a more efficient decoding with less amount of calculation and parallel processing ability (column 5 lines 10-25).

Regarding **claims 3 & 15**, further Iwamura teaches generating word metric comprising sum of the bit metrics (FIG.12). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the decoding taught by Iwamura (Abstract, FIG.3) in Yamao et al.'s FSK energy detector to have a more

efficient decoding with less amount of calculation and parallel processing ability (column 5 lines 10-25).

Regarding **claims 4 & 16**, Iwamura teaches identify the codeword having the greatest bit metric (column 3 lines 19-22 where the indication of reliability is in order, S213 FIG.12). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the decoding taught by Iwamura (Abstract, FIG.3) in Yamao et al.'s FSK energy detector to have a more efficient decoding with less amount of calculation and parallel processing ability (column 5 lines 10-25).

4. Claims 5-9, 11-12, 17-21, & 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamao et al. (US 6351498 B1) in view of Iwamura (US 5742620) as applied to claim 1 above, and further in view of Decrouez (US 5701332).

Regarding **claims 5 & 17**, Yamoe et al. discloses the detector and its method. It comprises an envelope detector being adapted to generate a soft symbol energy (212-213 FIG.7, 14 FIG.13), but not specify the plurality filters. However Decrouez teaches an envelope detector including a plurality of filters and energy calculation circuit (Abstract, 1-4 Fig.1). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the filers taught by Decrouez implemented in Yamoe et al.'s envelope detector to have a fast, reliable and simple designed FSK decoder.

Regarding **claims 6-7, 11, 18-19, & 23**, Yamoe et al. does not specify the upper bound, however Decrouez teaches the potential symbols corresponding to the subsets of symbol of a binary 1 and binary zero selected closest to an upper bound energy threshold (column 1 lines 60-67 where the output level of the filter is at a certain level/closest to an

upper bound). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the filers taught by Decrouez implemented in Yamoe et al.'s envelope detector, wherein the subsets of symbols (binary 1 or binary zero) are for the first or second phase (d-1, d-2 FIG.19), to have a fast, reliable and simple designed FSK decoder.

Regarding **claims 8, & 20**, Yamoe et al. discloses a discriminator detector adapted to generate an output energy (36 FIG.19, FIG.21, column 10 lines 43-58), and the decoder is adapted to compare the output energy to a plurality of potential symbol energy thresholds and select the soft symbol energy closest to the associated potential symbol energy (column 10 line 58-column 11 line 45) for the binary 1 and binary zero symbols.

Regarding **claims 9 & 21**, Yamoe et al. does not specify the upper bound, however Decrouez teaches the potential symbols corresponding to a binary 1 and binary zero selected closest to an upper bound energy threshold (column 1 lines 60-67 where the output level of the filter is at a certain level/closest to an upper bound). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the filers taught by Decrouez implemented in Yamoe et al.'s envelope detector to have a fast, reliable and simple designed FSK decoder. With the Decrouez's implementation in Yamoe et al.'s detector, the energy output to the decoder with Iwamura's decoding algorithm, the decoder is adapted to clip the soft energy values at a maximum value to obtain the invention of claim 9.

Regarding **claims 12 & 24**, Yamoe et al. discloses a third and fourth set of symbols for the second phase. The decoder (36 FIG.19, FIG.21, column 10 lines 43-58) adapted to select the soft symbol energy closest to the associated potential symbol energy

(column 8 lines 28-60 where the symbol energy measured, column 10 line 58-column 11 line 45, where the bits selected according to the associated potential symbol energy provided) for the binary 1 and binary zero symbols of the subset of the symbols corresponding to a binary 1 and binary zero for the second phase.

5. Claim 10 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamao et al. (US 6351498 B1) in view of Iwamura (US 5742620) as applied to claim 8 above, and further in view of Mays et al. (US 5278870).

Regarding **claims 10 & 22**, Yamoe et al. does not explicitly specify the channel attenuation estimate, however Mays et al. teaches the decoder is adapted to generate a channel attenuation estimate (FIG.5). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the channel estimator taught by Mays et al. in Yamoe et al.'s decoder to receive the output from the FSK energy detector (wherein the signals of in-phase and quadrature are available to perform the channel attenuation estimate) to have the channel attenuation estimate to reduce the interference in an RF received signal (column 2 lines 5-10).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 703-308-7728. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
July 12, 2004

YOUNG T. TSE
PRIMARY EXAMINER